

COMPLETE SET OF PENDING CLAIMS

1. (Previously Presented) A method for cleaning a flat media workpiece comprising the steps of:

forming a boundary layer of a heated liquid on the workpiece;

providing ozone into the environment around the workpiece; and

directing a liquid jet through the boundary layer to physically dislodge a contaminant on the workpiece.

2. (Previously Presented) The method of claim 1 where the liquid jet comprises water.

3. (Previously Presented) The method of claim 1 where the liquid jet is pressurized to about 100-15,000psi.

4. (Previously Presented) The method of claim 1 where the liquid jet is pressurized to about 400-800psi.

5. (Previously Presented) The method of claim 1 further comprising the step of heating the liquid jet to 65-99 degrees C.

6. (Original) The method of claim 1 where the ozone is provided as a dry gas into the environment around the workpiece.

7. (Previously Presented) The method of claim 1 where the ozone is provided into the environment around the workpiece by introducing ozone into the liquid used to form the liquid jet.

8. (Original) The method of claim 1 further comprising the step of spinning the workpiece to help form the boundary layer

9. (Original) The method of claim 2 where the liquid further comprises a member selected from the group consisting of hydrofluoric acid, hydrochloric acid, ammonium hydroxide, and hydrogen peroxide.

10. (Original) The method of claim 1 where the liquid comprises a member selected from the group consisting of sulfuric acid, phosphoric acid, and halogenated hydrocarbons.

11. (Original) The method of claim 1 further comprising the step of irradiating the workpiece with electromagnetic energy.

12. (Original) The method of claim 11 wherein the electromagnetic energy comprises a member selected from the group consisting of ultraviolet, infrared, microwave, gamma or x-ray radiation.

13. (Previously Presented) The method of claim 1 further comprising the step of moving the liquid jet relative to the workpiece, so that substantially all areas of the workpiece surface facing the jet are exposed at least momentarily to the jet.

14. (Previously Presented) The method of claim 1 where the liquid jet is perpendicular to the workpiece.

15. (Original) The method of claim 13 further comprising the step of placing the workpiece within a process chamber.

16. (Original) The method of claim 8 where the workpiece is rotated at about 100-2000rpm.

17. (Previously Presented) The method of claim 13 further including the step of moving the liquid jet on a swing arm within the chamber.

18. (Original) The method of claim 1 further comprising the step of introducing sonic energy to the workpiece.

19. (Original) The method of claim 18 where the sonic energy is introduced to the workpiece by a sonic transducer in the chamber and in contact with the workpiece.

20. (Previously Presented) The method of claim 18 where the sonic energy is introduced to the workpiece by introducing sonic energy into a nozzle forming the liquid jet.

21. (Previously Presented) The method of claim 1 further comprising the step of cooling the heated liquid to a temperature below ambient, to increase the density of the heated liquid and the energy imparted to the workpiece as the liquid jet contacts the workpiece.

22. (Previously Presented) The method of claim 1 where the liquid jet has a diameter of from about .5-10 mm.

23. (Previously Presented) The method of claim 1 where the workpiece has a top surface and a bottom surface, and where the liquid jet is directed from below against the bottom surface.

24. (Original) The method of claim 13 where the relative movement occurs at a rate of from about .5 – 500 linear mm per second.

25. (Previously Presented) A method for cleaning a flat workpiece comprising the steps of:

heating a liquid;

providing a heated liquid onto a surface of the workpiece;

spinning the workpiece to form the heated liquid into a boundary layer;

moving a high pressure liquid jet across the surface of the workpiece, with the jet penetrating through the boundary layer and impacting against the surface of the workpiece, to physically remove a contaminant from the surface; and

providing ozone around the workpiece, with the ozone diffusing through the boundary layer.

26. (Original) The method of claim 25 where the ozone is provided by placing the workpiece into a chamber and supplying ozone gas into the chamber.

27. (Previously Presented) The method of claim 25 where the ozone is provided by supplying ozone into the liquid forming the liquid jet.

28. (Original) The method of claim 25 further comprising heating the workpiece.

29. (Previously Presented) The method of claim 28 where the heating is performed by heating the liquid jet.

30. (Original) The method of claim 28 where the heating is performed by introducing steam to the workpiece.

31-34. (Cancelled)

35. (Original) A method for cleaning a flat media workpiece comprising the steps of:

forming a boundary layer of a heated liquid on the workpiece;

providing ozone into the environment around the workpiece, with the ozone diffusing through the boundary layer; and

directing a jet of steam through the boundary layer to physically dislodge a contaminant on the workpiece.

36. (Original) The method of claim 35 where the boundary layer of heated liquid is formed via condensation of the steam from the jet of steam.

37. (Previously Presented) The method of claim 1 where the boundary layer of heated liquid is formed from the liquid jet.

38. (Cancelled)

39. (Previously Presented) The method of claim 1 wherein the liquid jet is at an oblique angle to the workpiece.

40. (Previously Presented) The method of claim 1 wherein the heated liquid is at a temperature in the range of 55-120° C.

41. (Previously Presented) The method of claim 40 wherein the heated liquid is at a temperature in the range of 85-105° C.